

**Southall Bros. & Barclay**

(LIMITED).

**SIXTEENTH ANNUAL  
LABORATORY REPORT**

**BIRMINGHAM,**

**1908.**



# SIXTEENTH ANNUAL REPORT

FROM THE

ANALYTICAL LABORATORIES

OF

SOUTHALL BROS. & BARCLAY  
(LIMITED).

---

EDITED BY

E. W. MANN, PH.C., F.C.S.,

BIRMINGHAM,

JANUARY, 1908.




---

PRIVATE PRESS OF

SDUTHALL BROS. & BARCLAY, LTD.

---





## PREFACE.

---

LAST year we were glad to report that our Annual Laboratory Reports were being increasingly sought after by Pharmacists and Analysts at home and abroad. This year we are not only able to record a continuance of this demand, but also to note that our efforts have now received the sincerest flattery of all—that of imitation.

In the Pharmaceutical world the event of the year has doubtless been the publication of the British Pharmaceutical Codex, a work which we believe, errors notwithstanding, is destined to play an important part in the evolution of British Pharmacy. We record elsewhere that our Synopsis of this work, issued promptly after publication, received an excellent reception, and has had to be reprinted.

Liquid Extract of Ipecacuanha and the merits or otherwise of the official method for its preparation have received considerable attention at our hands during the year, an account of the research being included in the ensuing pages.

We have, as is customary, drawn from our Laboratory Journal a selection of facts and figures which we trust may be found to prove of value and of interest to our readers.

In this selection will be found points bearing on the important questions of the purity and uniformity of drugs which are of such vital moment to the public, the Medical Practitioner, and the Pharmacist.

# CONTENTS.

---

	PAGE.
Preface ... ..	3
Crude Drugs, Fixed Oils, etc. ... ..	5
Essential Oils ... ..	16
Chemical Preparations ... ..	23
Galenical Preparations ... ..	27
Liquid Extract of Ipecac. ... ..	29
Table of Standards for Galenicals ... ..	33
Physio-toxic Standardisation ... ..	40
Southall's Materia Medica ... ..	41
"Standard" Powder Sets ... ..	42
The Qualified Retail Chemist and Analytical Work ... ..	43
Guarantee of B.P. Quality ... ..	44

# CRUDE DRUGS, FIXED OILS, WAXES, etc.

THE examination and valuation of Crude Drugs and other similar natural products forms a highly important section of the work of this laboratory, not only owing to their great liability to natural variation in strength and other characters, but also since they lend themselves in many cases to wilful sophistication. It is not always easy to distinguish to which of these classes abnormalities belong as in the case of the Belladonna Root instanced below; there can however be no doubt that the foreign-ground Hellebores are examples of deliberate and fraudulent adulteration. We append a selection of the more interesting results obtained in the course of a year's work.

## DATA.

Unless otherwise specified, the following data apply to all figures given in the following pages.

Specific gravity ..  $d_{15}^{15.5^{\circ}\text{C.}}$

Optical rotation .. =degree of rotation, with sodium light, using 100 mm. tube.

Temperature in degrees centigrade.

Acid, Ester, Saponification values

are equivalent in each case to the number of milligrammes of KHO required for 1 gramme of the substance, to neutralize the acid, saponify the Ester, or in the case of saponification to the sum of these two.

**Aloes, Socotrine.**—Thirteen samples have been examined for solubility in water, the results obtained varying from 25·1 to 56·1 per cent. and averaging 38·6 per cent. It should be noted that this figure represents actual dry water-soluble matter in the Aloes as commercially offered.

**Araroba.**—A single specimen submitted to the chloroform test of the B.P. fell slightly short of the official standard, 48·72 per cent. being the yield obtained.

**Asafetida.**—We are able to note a very considerable improvement in parcels of this drug offered. In no case however were the exacting requirements of the B.P. attained. Five samples were examined with the following results:—

Mineral matter	13·36 to 21·67 per cent.,	average	17·35
Solubility in 90 per			
cent. alcohol	25·76 to 47·32	„	„ 40·46

**Beeswax, white.**—Twenty-five samples have been tested during the year, of which six showed specific gravities ranging from 0·911 to 0·952, although in most cases the melting-point was normal or even a little high. Paraffin in the form of white ceresin was the adulterant present.

The peculiarity of low “acid value” has again been met with in samples otherwise normal, and in this connection it is interesting to note that a sample of Annam wax [see *J.C.S. abstr.* 1906, p. 924] has been reported as giving an acid number of 7·8.

**Beeswax, yellow.**—But one of the ten samples examined showed any departure from the recognised figures; paraffin was suspected and proved by the



application of a modified sulphuric acid test. The actual figures obtained were:—

Specific gravity	...	...	...	...	0.9575
Melting-point	...	...	...	...	60°C.
Acid value	...	...	...	...	17.81
Saponification value	...	...	...	...	69.33
Hübl ratio	...	...	...	...	2.8

**Belladonna Root.**—Fifteen parcels of the drug have been assayed during the year with very unequal results. Amount of total alkaloid by titration ranged from 0.05 to 0.55 per cent., nine samples giving figures of 0.4 per cent. and over.

The extraordinarily low figure of 0.05 per cent. yielded by one specimen induced us to make a closer examination; physically it possessed the normal characters, and microscopically its powder was indistinguishable from that of a standard root; exhausted with alcohol 19.16 per cent. of extractive was obtained as compared with 13.12 per cent. for a root yielding 0.42 per cent. of total alkaloid.

It would appear from these results that the low proportion of alkaloid was probably due to overheating during drying, although the appearance of the root hardly confirmed this.

**Benzoin, Sumatra.**—We have again examined a large number of samples by the methods detailed in a former report (No. 11, p. 30, or *Chemist & Druggist*, March 15th, 1902). The results obtained seem to show that, as compared with previous years, the quality of this drug as offered commercially, is steadily deteriorating:—

Solubility in 90 per cent. alcohol	...	52.9 to 80.3 per cent., average 64.4
Free Balsamic Acids, calculated as Benzoic Acid	6.99 to 11.01 per cent., average 8.74	
Combined Balsamic Acids, calculated as Benzoic Acid	8.30 to 13.18 per cent., average 11.20	

A single sample of the Siam variety gave the following characteristic figures :—

Solubility in 90 per cent. alcohol ...	92.40 per cent.
Free Balsamic Acid, calculated as	
Benzoic Acid ... ..	3.71 „
Combined Balsamic Acid, calculated	
as Benzoic Acid ... ..	28.90 „

**Cannabis Indica.**—Six samples of the Indian-grown drug gave :—

Soluble in 90 per cent. alcohol	14.92 to 19.60 per cent., average 16.41
Resin ... ..	10.32 to 16.00 „ „ 12.38.

Two other specimens not Indian were examined :—

	EUROPEAN	MADAGASCAR
Soluble in 90 per cent. alcohol...	10.82 per cent.	15.00 per cent.
Resin ... ..	4.52 „	12.40 „

Circumstances did not permit of a comparison of the therapeutical properties of these extracts with the official.

**Carmin.**—We again note considerable variation in amount of mineral matter present, figures ranging from 3.1 to 9.7 per cent. being obtained.

**Cascara Sagrada.**—Fifteen samples yielded to cold water extractive ranging from 21.64 to 26.04 and averaging 24.0 per cent.

**Catechu.**—A single sample of the official variety contained 93.6 per cent. soluble in 90 per cent. alcohol.

**Chaulmoogra Oil.**—A single sample examined gave :—

Saponification value ... ..	204.4
Iodine absorbed... ..	100.7

**Coca Leaves.**—Eight samples of sound Peruvian leaves assayed for total alkaloid gave 0·70 to 1·17 per cent., averaging 0·86 per cent. Three samples of Bolivian leaves gave total alkaloid 0·32, 0·30, and 1·13 per cent. respectively.

**Cochineal.**—A single sample, “silver grain,” proved satisfactory. Ash-yield 2·75 per cent. Water-soluble matter 42·02 per cent.

**Coco-nut Oil.**—Numerous parcels have been examined with the following results:—

Specific gravity at 99°C. ...	... 0·872 to 0·876
Melting-point ...	... 26° to 28°C.
Saponification value ...	... 258·1 to 262·6

**Copaiba.**—We still meet with many parcels of this drug giving more or less distinct colour reactions when tested according to the British Pharmacopœia, although in most cases we have been unable to confirm the presence of Gurjun balsam by the application of quantitative tests (see Report No. 12, p. 14). Two samples of Maracaibo and Maranham balsam gave the following results:—

	MARACAIBO	MARANHAM
Specific gravity ...	0·9897	0·9832
Resin ...	49·4 per cent.	48·7 per cent.
Acid number ...	73·4	70·7
Ester number ...	7·1	7·4
Resin acid factor ...	0·673	0·689
B.P. colour reactions	Purple	Purple

The following table gives the results obtained from the examination of a number of samples of unknown source:—

Specific gravity	0.981	0.979	0.979	0.961	0.988	0.989	—	—	—
Resin	64.3	66.8	60.7	30.2	56.4	56.0	68.9 (soft)	55.3	51.5
Acid									
No.	74.0	83.7	80.8	41.1	80.5	78.9	78.4	83.3	68.7
Ester									
No.	16.0	15.1	15.1	17.4	7.8	10.9	24.1	6.1	5.9
Resin acid factor	0.869	0.798	0.751	0.734	0.701	0.710	0.878	0.663	0.750
B.P.colour reactions	faint purple	satisfactory	satisfactory	faint purple	satisfactory	satisfactory	faint purple	distinctly purple	

**Ergot.**—Nine samples have been assayed for cold water extract the yield of dry extract varying from 12.20 to 23.12 per cent. and averaging 16.2.

This variation is extreme and tends to show the superiority of a fluid extract standardised physiologically over a preparation in which extractive only has been considered since, as we stated in our last report (p. 10) our experience is that usually physiological activity is in inverse ratio to the amount of extractive.

**Fennel Fruit.**—Six samples have been examined as to solubility in 70 per cent. alcohol, and for yield of oleo-resin to ether (0.717). The results are as follow:—

Soluble in 70 per cent. alcohol.,	8.60	10.48	8.40	7.40	10.6	14.60%	
Soluble in ether (0.717)	...	7.10	10.96	12.50	6.21	11.08	17.52%

In all probability the first and fourth of these have been partially exhausted of oil or mixed with wholly exhausted drug.

**Hellebore, white.**—Out of six samples of this drug in powder form which have been subjected to examination but two were genuine, all the others (foreign-ground) were adulterated in varying degrees with ground olive stones. The ash-yield of the former was 10.69 and 8.09 per cent., of the latter 3.70, 5.55, 10.66, and 5.72 per cent.

**Henbane, Egyptian.**—A small sample of this drug coming into our hands differed somewhat from those previously examined in containing a considerable proportion of leaves, former specimens having consisted almost entirely of stalks. Total alkaloid by titration 0.87 per cent.

**Insect Powder.**—A distinctively interesting application of Durrant's method of assay to this powder was to show the comparative values of a powder of our own grinding from closed flowers and a cheap powder offered in competition.

The former yielded 7.70 per cent. of oleo-resin of a yellowish colour, the latter but 3.26 per cent. and that distinctly green in colour, indicating the presence of ground stalks in the powder.

**Ipecacuanha.**—A very large number of parcels of this drug have been assayed by the method of the U.S.P. Alkaloid varied from 1.63 to 2.28 per cent., averaging 1.88 per cent., these results being very low and apparently showing deterioration in the general quality of Ipecac. root offered.

A sample of false Ipecac. which came to hand proved to consist of the roots and attached aerial stems of *Ionidium Ipecacuanha* (N.O. Violaceæ). The powder proved to be free from starch and alkaloid.

**Jalap.**—We again have to record the great difficulty which exists in securing this drug of the quality necessary to correspond with the official requirements. Nine samples examined yielded from 5.44 to 17.36 per cent. of resin, the average being 8.9 per cent.

**Kino.**—The three samples examined proved satisfactory. Soluble in boiling water 81.8 to 84.2 per cent.



**Lupulin.**—One of the samples examined proved to correspond with the Pharmacopœia requirements, the other was distinctly inferior :—

Mineral matter	...	...	20·70	10·04	per cent.
Soluble in ether	...	...	59·80	62·44	„

**Mangrove Bark** (the bark of *Rhizophora Mangle*).—A sample of this bark examined yielded 25·4 per cent. soluble in cold water, the extract being of a deep red colour and intensely astringent.

**Myrrh.**—Solubility in 90 per cent. alcohol determined on seven samples ranged from 18·44 to 33·16 per cent., averaging 25·6 per cent.

**Neatsfoot Oil.**—The two samples examined proved to absorb the amount of Iodine characteristic of the genuine product :—

Specific gravity...	...	0·916	0·918
Iodine absorbed	...	70·8	71·1 per cent.
Saponification value	...	192·5	194·4

**Nux Vomica.**—Seven samples of seeds have been assayed for total alkaloid and for strychnine, the results obtained showing remarkably little variation :—

Total alkaloid	...	2·65 to 3·29	per cent., average 2·94%
Strychnine	...	1·21 to 1·34	„ „ 1·28%

**Olive Oil.**—A very large number of samples have been examined for general purity and also for freedom from rancidity. We continue to apply the Halphen reaction in preference to the official test for cotton-seed oil but do not find this adulterant at all common in samples of oil commercially met with.

With regard to general quality, although the amount of free acid present is to an extent a criterion of quality, it cannot be absolutely relied upon as such, for example,

the oils examined during the year have been divided into three classes:—

- (1) High-class edible oils.
- (2) Oils not sufficiently sweet for inclusion in class 1, but suitable for pharmaceutical purposes.
- (3) Oils unsuitable for pharmaceutical purposes.

Free fatty acid, calculated as oleic acid ranged in

- (1) from 0.44 to 0.90 per cent.
- (2) „ 0.40 to 3.88 „
- (3) „ 1.80 to 18.00 „

Saponification values ranged from 187.0 to 195.3

Iodine absorbed ... .. 79.7 to 84.3%

**Peruvian Balsam.**—The four samples examined afforded the results given below, one proved to be somewhat deficient in cinnamein:—

Specific gravity ... 1.1486 1.1502 1.1403 1.1500

Ether residue

(B.P. test) ... 2.95 2.49 2.86 2.92 grammes.

Saponification

value of ditto 228.1 228.7 220.1 228.1

**Saffron.**—Twenty-four samples have been subjected to the B.P. and other tests. The greater number gave normal results. One, however, yielded 38.0 per cent. of ash; a second, labelled “superior,” gave ash 33.4 per cent., the mineral adulterant in this case being potassium nitrate.

**Shellac.**—Four samples have been examined with the results given below; the last sample was certainly not genuine:—

Acid number	...	55.2	58.6	54.5	57.4
Ester...	...	133.1	138.4	145.8	152.6
Iodine absorbed	...	10.5	6.9	11.3	19.4%

**Sperm Oil.**—Five samples have been tested during the year, one sample only yielding slightly abnormal figures:—

Specific gravity ...	...	...	0·879 to	0·881
Saponification value ...	...	...	122·5 to	134·1
Iodine value ...	...	...	79·5 to	84·0
Unsaponifiable matter ...	...	...	33·4 to	38·8%
Fatty acids ...	...	...	60·0 to	62·5%

The abnormal sample absorbed 104·2 per cent. of iodine and yielded 65 per cent. of fatty acids.

**Styrax.**—We again have to report exceedingly poor quality in the samples of this drug assayed during the year. The results obtained are:—

Soluble in								
90% alcohol...	59·8	56·4	74·0	72·5	59·8	67·5	53·7	
Insoluble in								
90% alcohol...	27·8	20·8	25·4	27·0	14·4	32·8	15·6	
Free balsamic								
acid as benzoic	1·36	1·06	1·40	1·21	1·04	1·32	1·30	
Combined bal-								
samic acid as								
benzoic ...	8·20	6·21	8·63	9·33	6·51	11·20	8·80	

**Theobroma Oil.**—Three samples examined gave figures characteristic of genuine cocoa-butter:—

Melting-point ...	...	29° to	31°C.
Iodine absorbed ...	...	34·9 to	37·2 per cent.
Saponification value ...	...	190·3 to	191·8

**Tolu, Balsam of.**—With one exception the parcels examined gave satisfactory results, the actual figures being:—

Soluble in 90 per cent. alcohol	...	77·9 to	84·8%
Insoluble in 90 per cent. alcohol	...	0·3 to	3·4%
Free balsamic acid as benzoic	...	8·97 to	13·46%
Combined balsamic acid as benzoic	...	15·70 to	21·83%

The remaining sample which was of a reddish-brown colour gave the following highly abnormal results:—

Soluble in 90 per cent. alcohol ...	89.0 per cent.
Insoluble in 90 per cent. alcohol ...	0.1 „
Free balsamic acid as benzoic ...	19.71 „
Combined balsamic acid as benzoic ...	9.24 „

**Refractive Indices of fixed oils.**—We have determined the refractive index of a number of carefully verified oils and fats by means of the “Abbe” refractometer and append some of the results:—

OIL.	TEMPERATURE.	REFRACTIVE INDEX.
Almond ...	15°C. ...	1.4723
Arachis ...	15°C. ...	1.4716
Castor ...	15°C. ...	1.4804
Coconut ...	60°C. ...	1.4412
Cocoa-butter ...	60°C. ...	1.4496
Cod liver ...	15°C. ...	1.4800
Colza ...	15°C. ...	1.4744
Cotton-seed ...	15°C. ...	1.4744
Linseed ...	15°C. ...	1.4824
Mustard ...	15°C. ...	1.4775
Olive ...	15°C. ...	1.4707
Palm ...	60°C. ...	1.4491
Poppy-seed ...	15°C. ...	1.4763
Peach-kernel ...	15°C. ...	1.4763
Sesame ...	15°C. ...	1.4745
Sperm ...	15°C. ...	1.4670

## ESSENTIAL OILS.

THE occurrence of high prices for Bergamot and Lemon Oils has brought upon the market more or less skilful mixtures, particulars of some of which are given below. Oil of Turpentine, too, needs careful attention, since much care is paid to producing substitutes capable of passing some of the more frequently-applied tests.

**Aniseed.**—Six samples have been examined, all of which proved to be laevo-rotatory and satisfactory in other respects.

**Bergamot.**—Among the fifteen samples assayed during the year have been several which even to superficial tests were obviously substitutes. The following are figures obtained in the examination of some of these:—

Specific gravity ...	0.8668	0.8634	0.8639
Linalyl acetate ...	11.57	9.5	10.2 per cent.

None soluble in 2 vols. of 80 per cent. alcohol.

The admixture was probably lemon oil or terpenes, or a mixture of these with orange oil.

Other samples gave:—

Specific gravity...	...	0.8741 to 0.8850
Linalyl acetate ...	...	27.17 to 41.80 per cent.

Not all these samples were soluble in 2 parts of 80 per cent. alcohol, this including some of high ester percentage.

**Cajuput Oil.**—Specific gravities of five oils showed little variation 0.921 to 0.922, a satisfactory proportion of Cineol being present in each case.



**Caraway Oil.**—A comparative examination of oils of English and foreign distillation showed but little difference in the characters of the two oils :—

	ENGLISH.	FOREIGN.
Specific gravity ...	0·9055	0·9080
Rotation ...	+80°	+79·25°
Distillate below 185°C.	8%	6·5%
Distillate above 200°C.	46%	52·0%

**Cinnamon Oil.**—We experience some difficulty in securing satisfactory parcels of this oil; formerly leaf oil was the adulterant to be guarded against, latterly however Cassia oil or what is more probable judging from the odour, synthetic Cinnamic aldehyde is being used for this purpose.

We append the results obtained, the three oils marked abnormal are probably adulterated, Nos. 2 and 3 with Cassia oil or Cinnamic aldehyde, No. 1 with a mixture of this and leaf oil. Oil No. 3 was offered as B.P. which of course it is not, and on remonstrating we were informed that the firm in question supplied two Cinnamon oils, “B.P.” and “pure” the latter having the higher price; comment is needless.

A maximum as well as minimum figure for aldehyde should be included amongst the official tests :—

	NORMAL.	ABNORMAL.		
		1	2	3
Specific gravity ...	1·012 to 1·023	1·055	1·027	1·040
Cinnamic aldehyde	70·0 to 71·4%	77·6%	81·0%	86·4%

**Citronella Oil.**—One sample only has been examined, the results obtained being satisfactory :—

Specific gravity ...	...	...	0·902
Rotation ...	...	...	-10·9°
Citronellal ...	...	...	54·5 per cent.

**Coriander Oil.**—The only sample examined proved to be perfectly satisfactory :—

Specific gravity	...	...	...	0·874.
Optical rotation	...	...	...	+9·88°

Soluble in 3 vols. of 70 per cent. alcohol.

**Dill.**—The following figures show that little difference exists between English and foreign distilled oil :—

	ENGLISH.		FOREIGN.	
Specific gravity	...	0·912 0·913	0·905 to	0·914
Rotation	...	76·0° 75·6°	73·1° to	77·45°
Distillate below 185°	6%	2%	4% to	12%
Distillate above 220°	30%	30%	24% to	29%

**Eucalyptus.**—A single specimen of the Amygdalina oil gave the following characteristic results :—

Specific gravity	...	...	...	...	0·870
Rotation	...	...	...	...	-47·25°

Phellandrene present.

**Fennel.**—We have not recently met with the de-anetholized oils to which we have formerly had to draw attention. Two samples examined gave very similar figures :—

Specific gravity	...	...	...	0·970	0·972
Rotation	...	...	...	+14·3°	+14·5°
Congeeing point	...	...	...	+6°C.	+6°C.

**Geranium Oil** (Turkish—Palmarosa Oil).—One sample of this oil gave highly interesting figures. Unfortunately we were unable at the time to follow the investigation further. We give the figures obtained for a genuine oil by way of contrast :—

	<i>Adulterated.</i>		<i>Genuine.</i>	
Specific gravity	...	0·971	0·891	
Geraniol	...	54·96 per cent.	90·62 per cent.	
In 3 vols. of 90% alcohol.		Not soluble.	Soluble.	

**Juniper.**—In view of the recent litigation with regard to this oil, the figures we are able to give for a number of samples should prove of interest:—

	ENGLISH OIL.	FOREIGN OIL.	
		<i>Probably genuine.</i>	<i>Adulterated.</i>
Specific gravity	0·870	0·865 to 0·883	0·870 0·866
Rotation	... -7·75°	-2·3° to -8·02°	-21·75° -22·3°

**Lavender.**—Samples of foreign oil examined have given better ester figures than was the case last year. Excluding oils not soluble in three volumes of 70 per cent. of alcohol, the amount of Linalyl acetate found ranged from 26·6 to 37·85 per cent.

**Lemon.**—Thirteen samples have been tested, with one exception giving normal figures, albeit somewhat low in optical rotation:—

Specific gravity	...	...	0·857 to	0·876
Rotation	...	...	+57°	to +60·2°

The thirteenth sample gave:—

Specific gravity	...	...	...	...	0·866
Rotation	...	...	...	...	+36·25°

**Orange Oil.**—The characters of the oils examined during this year were as follows:

	BITTER.		SWEET.	
Specific gravity	...	0·855	0·849,	0·849
Rotation	...	+90·25°	+96·46°, +95·06°	

**Peppermint Oil.**—A large number of samples have been assayed of English, American, and Japanese (dementholized) oils, the variation in properties within each class being extremely small:—

	ENGLISH.	AMERICAN.	JAPANESE.
Specific gravity	0·904—0·906	0·907—0·909	0·899—0·901
Menthyl acetate	5·20 to 6·68%	6·99 to 7·69%	11·29 to 14·1%
Free Menthol	53·12 to 57·36%	52·64 to 55·30%	49·9 to 53·29%

**Petitgrain.**—Three samples have been examined, the third in order being probably adulterated:—

Specific gravity	...	...	0·890	0·885	0·886
Esters as Linalyl acetate	...	46·2	46·1	33·4%	
All soluble in 2 vols. of 80 per cent. alcohol.					

**Pine** (*Pinus pumilio*).—None of the samples examined complied exactly with the Pharmacopœia requirements:—

Specific gravity	...	0·863	0·864	0·870
Rotation	...	−8·05	−12·5°	−12·75°
Bornyl acetate	...	5·06	5·90	5·62%
Distillate to 165°C.	...	23%	nil	2%

**Pine** (*Pinus Sibirica*).—Four samples offered as *Oleum Pini Sylvestris* corresponded in properties to Siberian Pine Needle Oil and differed widely from the true oil of *Pinus Sylvestris*. The actual figures were:—

Specific gravity	...	...	0·911 to 0·914
Rotation	...	...	−40° to −41°
Esters as bornyl acetate	...	36·57 to 41·01	per cent.

**Pennyroyal.**—Two samples of English distilled oil gave normal figures:—

Specific gravity	...	...	0·940	0·934
Rotation	...	...	+18·75°	+16·39°
Soluble in 2 vols. of 70 per cent. alcohol.				

**Rosemary.**—With one exception oils examined during the year have proved satisfactory although in one case the degree of rotation was in excess of the official limits:—

Specific gravity	...	0·890	0·908	0·909	0·913
Rotation	...	−1·76°	+3·1°	+10·5°	+8·5°

**Savin.**—The differences between the characters of the English and foreign distilled oils examined were not

marked, the latter being much superior to the foreign oils formerly met with:—

	ENGLISH.		FOREIGN.	
Specific gravity	...	0·928	...	0·922
Rotation	...	+50·35°	...	+41·95°
Distillate to 200°C.	..	34%	...	33%
Soluble in 1 vol. of 90 per cent. alcohol.				

**Sassafras.**—The only sample examined proved to be satisfactory:—

Specific gravity	...	...	...	1·078
Rotation	...	...	...	+4·25°

**Sandal Wood Oil.**—As manufacturers of capsules, our purchases of this oil are on an extensive scale, and we find it necessary to devote considerable attention to its examination. Many samples have been tested during the year, and in no case did we find reason to object to any of them. In our experience many samples require a temperature of 20°C. to effect solution in 6 vols. of 80 per cent. alcohol:—

Specific gravity	...	0·975 to	0·980
Rotation	...	-16·0° to	-17·75°
Santalol	...	91·43 to	97·48 per cent.
All soluble in 6 vols. of 80 per cent. alcohol at 20°C.			

**Spearmint.**—

Specific gravity...	...	...	0·935 to	0·947
Rotation ...	...	...	-44·75° to	-46·25°

The above results are characteristic of genuine oil.

**Thyme.**—A single sample of white Thyme oil proved highly satisfactory, the following being the results obtained:—

Specific gravity	...	...	...	0·917
Rotation	...	...	...	+0·25°
Phenols	...	...	...	46·7 per cent.

Soluble in 2 vols. of 80 per cent. alcohol.



Commercial Oil of Origanum appears to be a name to cover anything but Origanum oil; we have recently met with samples containing less than 1 per cent. of phenols.

**Turpentine.**—Samples of genuine American turpentine proved to be both laevo-and dextro-rotary, and we find that the bulk of the oil distils over at a somewhat lower temperature in the case of the dextro-rotary samples.

The following are the figures obtained by the analysis of two of the Turpentine substitutes met with during the year:—

Specific gravity ...	...	0·861	...	0·860
Rotation ...	...	+13·7°	...	+39·12°
Commences to distil ...	...	158°C	...	135°C
Distillate	135° to 140°	...	...	1 per cent.
„	140° to 145°	...	...	1 „
„	145° to 150°	...	...	3 „
„	150° to 152°	...	...	8 „
„	152° to 153°	...	...	65 „
„	153° to 154°	...	...	10 „
„	154° to 155°	...	...	5 „
„	158° to 165°	37%	...	—
„	165° to 170°	39%	...	—
„	170° to 180°	18%	...	—

## CHEMICAL PREPARATIONS.

THE subject of "limits" for impurities in medicinal chemicals is one which has attracted a considerable amount of attention during the year. It has been held by some that the publication of the British Pharmaceutical Codex afforded an exceptional opportunity for propounding a series of limits in this direction which, while not possessing any legal status at present, would serve as a basis, and by the research and discussion inevitably aroused would eventually be rendered acceptable for inclusion in the Pharmacopœia.

Such standards should prove of the greatest value to pharmacists, analysts, and manufacturers. The difficulty lies in fixing limits acceptable to all, and it is to be hoped the same method of semi-official publication may be adopted to avoid the possibility of the trade generally being faced with academic and impracticable standards.

**Amyl Acetate.**—We find the commercial preparation to contain from 63·1 to 72·2 per cent. of Amyl acetate. A sample of "pure" indicated slightly over 100 per cent. calculated as  $C_5H_{11}$ ,  $C_2H_3O_2$ , and had a specific gravity of 0·879.

**Antimony Sulphide** (black).—A number of samples examined have proved to be less contaminated with siliceous matter than usual, the amount insoluble in boiling hydrochloric acid ranging from 0·40 to 1·94 per cent. Arsenic, always present, may, as in one specimen, reach as high a figure as 0·1 per cent.

**Antimony, Sulphurated.**—We find that the property required by the Pharmacopœia of solubility in solution of sodium hydroxide is not attained by any of the commercial samples we have been able to examine.

**Antimony, Tartarated.**—The presence of considerable traces of Arsenic has necessitated the rejection of two parcels of this preparation.

**Bole, Armenian.**—We have also had to reject a sample of this earth containing approximately 100 parts per million of Arsenic (equivalent to about 0.7 grain per lb.). This must be regarded as a serious quantity in view of the recommendation of the Royal Commission on arsenical poisoning that articles liable to be used in food should not contain more than  $\frac{1}{100}$  grain per lb.

**Borax.**—We still find it necessary to watch this article closely for the occurrence of Arsenic, several samples proved to contain 10 to 15 parts per million, another as much as 60 per million.

**Chalk, Precipitated.**—A very pure ground chalk has been offered as *Creta Præcipitata*.

**Calcium Phosphate** affords another instance of the necessity for the analytical control of chemical substances, one sample proving to contain very considerable traces of Arsenic.

**Chromic Acid.**—A specimen of this acid marked “purif.” gave 85.9 per cent. of  $\text{CrO}_3$ , sulphate was present in quantity.

**Citric Acid.**—In no case has the amount of lead present exceeded 0.001 per cent., or arsenic been more than 1 part per million, this from the examination of a very large number of samples.

**Iron; Reduced.**—Metallic iron, ranging from 86·07 to 95·61 per cent., and Arsenic from 30 to 100 parts per million are the satisfactory figures given by the year's work.

**Iron Sulphate.**—One sample of the commercial salt tested proved to contain a considerable proportion of Zinc Sulphate. Probably the source of the sulphate was galvanisers' pickle.

**Mercury and Zinc Cyanide** "Listers."—Carefully incinerated, properly prepared samples of this compound yield about 50 per cent. of ash, zinc oxide. We find from an examination of numerous commercial specimens of this compound that the true Lister's double cyanide is not often to be met with, usually we find the salt offered to contain considerable quantities of free Mercuric Cyanide soluble in cold water, and we cannot but think that the use of such a compound in preparing Double Cyanide Gauze is not only contrary to the intention of the originator, but is also likely to cause injury and pain to the patient. We may note here that Lord Lister (see *Lancet*, November 9th, 1889, and January 4th, 1890; also Year Book of Pharmacy, 1907, p. 269) insisted that if this double salt is to be properly prepared it must be washed practically free from soluble mercuric cyanide.

**Phosphoric Acid.**—Here, again, Arsenic to the extent of about 20 parts per million has caused the rejection of a batch of this acid.

**Pilocarpine Nitrate.**—Some improvement in the quality of this article has been manifest during the year, none of the samples offered having a melting-point lower than 170°C.

**Potassium Bitartrate** affords a good instance of the way in which, under the stimulation of a high standard, manufacturers are able to produce a very pure chemical without excessive cost. Comparing Cream of Tartar of to-day and the article current when we originally investigated the quality of the commercial drug (see *Pharmaceutical Journal*, 1888, June 16, p. 1045), the difference is remarkable, we have now no difficulty in obtaining Cream of Tartar testing at practically 100 per cent., nor have we in the present year met with any sample containing as much as .003 per cent. of lead or 1 part per million of arsenic.

**Sulphur, Precipitated.** — Out of eight samples examined seven were to all intents and purposes free from Arsenic. The remaining sample, however, was grossly contaminated in this respect, the amount present being not far short of 100 parts per million.

**Zinc Oxide.**—In this case, again, Arsenic is an extremely common impurity. We have found during the year a variation of from  $\frac{1}{2}$  to 500 parts per million in the different samples examined. Lead, too, is frequently present in prohibitive amounts.



## GALENICAL PREPARATIONS.

---

UNDOUBTEDLY the chief feature of the year in connection with Galenic Pharmacy has been the publication of the British Pharmaceutical Codex, and in this connection we are glad to be able to record that the Synopsis we published within a short time of issue was highly appreciated, and has been made use of by many pharmacists as a means of bringing the Codex before the notice of the medical profession. With regard to the Codex itself, we think it should prove of the utmost value to British pharmacy, and while it is undeniable that the work contains much that is capable of improvement, this might almost be expected in the first edition of a work of such extent.

**Belladonna, Green Extract.**—As usual, we have made an assay of the season's extract of our own manufacture after careful bulking, 1.57 per cent. of total alkaloid by titration being obtained. This figure is exceptionally high, and well illustrates the necessity for standardising this product or else for replacing it by a more reliable preparation. This is more evident when we say that four extracts procured from external sources yielded of total alkaloid by titration 0.75 to 1.02 per cent., figures far removed from that given by our own extract.

**Benzoin, Compound Tincture.**—We have made some experiments on the determination of the solids of this tincture on the lines of the methods suggested by Dowzard (*Chemist & Druggist* [64] p. 327) and Alcock (*Pharmaceutical Journal*, 1907 [2] p. 738).

Five cubic centimetres of a standardised tincture were evaporated to dryness, (1) alone, (2) with 1 gramme Magnesia, (3) with 1 gramme Zinc Oxide, (4) with 1 gramme Lead Oxide. The experiments were carried on simultaneously on a water bath, the dishes used were of identical size and shape, and the oxides were ignited previous to use. Weighings made at the end of two hour intervals gave the following amounts of solids as grammes per 100 c.c. of the tincture:—

	1	2 With MgO.	3 With ZnO.	4 With PbO.
2 hours	20·04	20·31	20·55	20·09
4 „	19·68	20·26	20·18	19·96
6 „	19·47	20·24	20·09	19·83
8 „	19·35		20·03	19·79
10 „	19·26		19·99	19·78
12 „	19·25			

It is evident from these figures that Dowzard's method gives the most rapid as well as the highest results. Apparently zinc and lead oxides do not effectually “fix” the volatile acids, or else the compounds formed are slowly decomposed by continued heating.

We ourselves determine extractive of this tincture as a matter of interest only, since we standardise to a definite proportion of free and combined aromatic acid.

**Carbolic Powder.**—A sample of this which recently came into our hands and purported to contain 15 per cent., gave but 4·2 per cent. of total crude carbolic acid assayed by Allen's method; the base was lime.

**Codex Preparations.**—Among the formulæ which appear to us to need some revision are those for *Syrupus Ficorum* in which the quantity of sugar is too small for the syrup to keep satisfactorily; *Unguentum Iodi*

*Denigrescens*, short of volatilising the greater part of the iodine we have not been able to obtain an ointment which does not stain, even on very prolonged heating; *Elixir Pini et Terpini et Acetomorphinae*, we regard the amount of Oil of Pine ordered as excessive, and certainly the formula is unmanageable if the whole amount of Light Magnesium Carbonate ordered is used.

**Conium, Green Extract.**—We obtained 0.38 per cent. total alkaloid as hydrochloride as the strength of the season's extract of our own manufacture.

**Conium Juice** yielded 0.06 per cent. total alkaloidal hydrochlorides.

**Colchicum Extract.**—A sample drawn from a large batch of this extract yielded 1.20 per cent. total alkaloids.

**Henbane, Green Extract.**—As was the case with Belladonna, our extract proved to contain a high proportion of alkaloid, the figure being 0.18 per cent. by titration. This is the highest figure we have yet recorded.

**Ipecacuanha, Liquid Extract.**—It has been our practice in preparing Liquid Extract of Ipecac. to follow the B.P. directions, and mix the marc with lime after a preliminary exhaustion with spirit. The advisability or otherwise of this procedure has often been questioned, and the following experiments have been made in the Laboratory in order to demonstrate if possible any advantages or disadvantages attendant upon it.

Two parcels of Rio root were used in the work, "A" a root yielding 1.76 total alkaloid by titration, "B" yielding 2.00 per cent.; in each case the assay of the root was made by the method of the U.S.P.

From each of these samples, two experimental batches of fluid extract were prepared, No. 1 strictly according to the official directions; No. 2 following the same method, except that no addition of lime was made, percolation being completed to exhaustion with spirit.

A fifth experiment was an attempt to prepare a fluid extract from root "B" without the use of heat, the method adopted being that of repercolation. A pound of the root was divided into three parts and repercolated in the usual manner.

During preparation no appreciable difference was shown in the two methods with the exception of the deposit afterwards referred to; in each, with lime or without, exhaustion was equally tedious, a very considerable amount of solvent having to be employed before the percolate could be termed free from alkaloid.

Each fluid extract was then examined for specific gravity, total solids, ash, alkalinity of ash and total alkaloid by weight, the latter being determined by Bird's process. The results obtained are embodied in the following table:—

	<b>A</b>		<b>B</b>		
	No. 1 B.P.	No. 2 without lime.	No. 1 B.P.	No. 2 without lime.	No. 3 by reper- colation.
Specific gravity ...	0.8977	0.9202	0.8821	0.8954	0.8750
Total Solids...	12.77	16.54	8.94	10.71	7.27
Ash ...	0.10	0.20	0.05	0.16	0.05
Alkalinity of					
Ash as $\text{CaCO}_3$	0.08	0.13	0.05	0.10	0.05
Total Alkaloid	1.88	1.91	1.96	1.77	1.25

(All figures as grammes per 100 c.c., and represent the means of two determinations).

As regards the yield of alkaloid the figures are somewhat inconclusive, in one case the amounts are very nearly

equal, in the other the lower figure is given by the extract prepared without the use of lime. It is also interesting to note that in no case is the B.P. standard actually reached, nor are the amounts of alkaloid present proportional to those contained in the different roots. The re-percolation experiment failed to produce an extract of satisfactory strength, the loss through incomplete exhaustion being judged too great.

Possibly the most remarkable result of the use of lime seems to be in the striking way in which it decreases both solids and ash; this diminution is accompanied by the presence of a voluminous deposit which has a serious effect upon the yield of clear filtered extract. It is not obvious to what reason this deposition of extractive matter is due, apparently the effect of the lime treatment is to render soluble a substance which forms an insoluble compound with the portion previously extracted with spirit alone.

We intend making further experiments with other samples of root to finally settle whether the use of lime has any influence upon the alkaloidal strength of the extract, but it is evident that one result of its omission is to prevent the formation of a wasteful deposit, and to ensure more economical working.

**Liquorice Juice.**—A large number of commercial samples of the stick juice have been examined as to their solubility in cold water. The result obtained showed considerable variation, viz. from 49·52 to 78·40 per cent. We consider that this preparation should yield at least 60 per cent. to cold water.

**Podophyllin.**—We have confirmed our results of last year regarding the different behaviour of the resins from American and Indian Podophyllin when tested by

Dott's application of the Ammonia test (*Pharmaceutical Journal*, 1906 [2] p. 421). A sample of the resin from the American root manufactured in our own laboratories yielded a residue of 6.50 per cent., insoluble in Ammonia, while a specially prepared resin from *Podophyllum emodi* proved to yield 50.80 per cent. insoluble.

**Stavesacre Oil.**—A batch of this oil prepared for parasiticide purposes was assayed as usual and proved to contain 2.11 per cent. total alkaloids.

**Terebene.**—A batch prepared from genuine American Oil of Turpentine gave results on examination which conform with those we have previously recorded:—

Specific gravity	...	...	...	0.854
Optical rotation	...	...	...	0.03°
Distillate below 165°	...	...	...	3 per cent.
„ 165°—180°	...	...	...	94.5 per cent.



*TABLE*  
SHOWING SUGGESTED STANDARDS, RANGES  
OF SPECIFIC GRAVITY, ETC.,  
FOR  
*GALENICAL PREPARATIONS.*

Name of Preparation.	Range of Specific Gravity.	STANDARD. (Where there is no active principle mentioned the figure given represents total extractive.) Grammes per 100 c.c.	Range of per-centage (by vol. me. of Alcohol.	REMARKS
Acetum Cantharidis .. ..	1·066 to 1·072	3·62 HA.	11 to 12·5	
" Ipecacuanhæ .. ..	0·991 to 0·993	0·1 total alkaloid		
" Scillæ .. ..	1·035 to 1·040	8·0		
Collodium .. ..		4·0 acetic acid		
" Flexile .. ..	0·775 to 0·782	2·0		
Decoctum Aloes Compositum .. ..	0·790 to 0·797	6·5		
" Granati Corticis Conc. .. ..	1·001 to 1·004	5·6	16 to 17	
" Hæmatoxyli Conc. .. ..		30·0		
Extractum Belladonnæ Liquidum .. ..		3·0		
" " Viride .. ..	0·896 to 0·912	* 0·75 total alkaloid	72·0 to 75·0	
" " Cascaræ Sagradæ Liquidum .. ..		1·0 total alkaloid		
" Cimicifugæ Liquidum .. ..	1·070 to 1·080	26·0	17·0 to 18·0	
" Cinchonæ Liquidum .. ..	0·890 to 0·900	12·5	74 to 78	
" Cocæ Liquidum .. ..	1·115 to 1·150	* 5·0 total alkaloid	10·5 to 12·0	
" Colocyntidis Compositum† .. ..	1·004 to 1·014	0·5 total alkaloid	45·5 to 49·5	
" Ergotæ Liquidum .. ..		20 ether soluble		
" Filicis Liquidum .. ..	1·020 to 1·027	15·0	31·5 to 32·5	Physio-toxically standardised, [see page 40.
" Glycyrrhizæ Liquidum .. ..	1·000 to 1·019			
" Hamamelidis Liquidum .. ..	1·140 to 1·150	42·0	16·0 to 18·0	
" Hydrastis Liquidum .. ..	1·025 to 1·050	21·0	33 to 34	
" Hyoscyami Viridi .. ..	1·025 to 1·040	20·0	37·5 to 38·5	
" Ipecacuanhæ Liquidum .. ..		0·1 total alkaloid minim.		
" " " .. ..	0·885 to 0·910	* 2·00 to 2·25 total alkaloid	75·0 to 79	
" Jaborandi Liquidum .. ..		20·0		
" Jalapæ .. ..	1·020 to 1·040	20 resin insoluble in ether	33 to 34	
" " " .. ..				
" Nucis Vomizæ Liquidum .. ..	0·950 to 0·970	* 1·5 strychnine	57·5 to 61·5	
" Opii Liquidum .. ..	0·985 to 0·990	* 0·75 morphine	17·5 to 18·5	

Extractum Pareiræ Liquidum	..	1'050 to 1'065	22'5 20'0 (without glycerine)	20 to 22
" Sarsæ Liquidum	..	1'080 to 1'090	4'0 strophanthin	15 to 17
" Strophanthi †	..	1'070 to 1'090	25'0	16 to 20
Glycerinum Acidi Borici	..	1'345		
" " Carbolic	..	1'230		
" " Tannici	..	1'288 to 1'292		
" Aluminis ..	..	1'288 to 1'292		
" Boracis ..	..	1'280 to 1'295		
" Pepsini ..	..	1'190 to 1'200		
Infusum Aurantii Conc.	..		1 fluid dr. should dissolve 12,000 grains hard boiled white of egg.	
" Compositum Conc.	..	10'2		
" Buchu Conc...	..	7'2		
" Calumbæ Conc.	..	6'0		
" Caryophylli Conc.	..	3'5		
" Cascariillæ Conc.	..	5'0		
" Chiratæ Conc.	..	2'0		
" Cinchonæ Acidum Conc.	..	4'5		
" Cuspariæ Conc.	..	1'0 total alkaloid		
" Digitalis Conc.	..	8'0		
" Gentianæ Compositum Conc.	..	1'6		
" Krameriæ Conc.	..	6'0		
" Lupuli Conc.	..	8'0		
" Quassiæ Conc.	..	7'0		
" Rhei Conc. ..	..	0'25		
" Scoparii Conc.	..	10'0		
" Senegæ Conc.	..	15'0		
" Sennæ Conc...	..	10'0		
" Serpentariæ Conc.	..	14'0		
" Uvæ Ursi Conc.	..	4'5		
Linimentum Aconiti ..	..	10'0		
	..	0'865 to 0'875	0'25 total ether soluble alkaloid	78'0 to 80'0
" Belladonnæ	..	0'880 to 0'900	*0'375 total alkaloid	69'0 to 72'0

\* Officially Standardized.

† Scammony resin

‡ P. J., 1898 (2), p. 665.

Name or Preparation.	Range of Specific Gravity.	STANDARD. (Where there is no active principle mentioned the figure given represents total extractive) Grammes per 100 c.c.	Range of percentage (by volume) of Alcohol.	REMARKS
Linimentum Camphoræ	0.924 to 0.927	21.5 camphor	57.0 to 58	
" " Saponis .. Ammoniatum	0.866 to 0.872		62 to 64.0	
Liquor Calumbæ Conc.	0.895 to 0.900	4.25	19.0 to 21.0	
" Chiratæ Conc.	0.990 to 0.996	5.5	18.0 to 19.0	
" Cuspariæ Conc.	1.000 to 1.010	10.0	18.0 to 19.0	
" Hamamelidis	1.005 to 1.015		16.0 to 18.0	
" Iodi Fortis ..	0.980 to 0.985	11.5 iodine	76.0 to 77.0	
" Krameriæ Conc.	1.010 to 1.025	10.9	18.0 to 19.0	
" Picis Carbonis	1.015 to 1.025	2.5	18.0 to 19.0	
" Quassiaæ Conc.	0.855 to 0.865	0.30	18.0 to 19.0	
" Rhei Conc. ..	0.975 to 0.980	12.5	18.0 to 20.0	
" Sarsæ Compositus Conc	1.020 to 1.030	15.0	18.5 to 22.0	
" Senegæ Conc. ..	1.030 to 1.040	12.5	18.0 to 19.0	
" Sennæ Conc. ..	1.015 to 1.025	17.5	18.0 to 19.0	
" Serpentariaæ Conc.	1.040 to 1.060	5.0	14.4 to 16.6	
" Mistura Sennæ Co. ..	0.990 to 1.000	16.5		
Oxymel ..	1.110 to 1.118	4.4 acetic acid 2.0 acetic acid		
" Scillæ ..	1.320*	9.0 sulphur 68 to 70 ash		
Pulv. Glycyrrhiæ Comp.	1.320*			
" Rhei-Comp.				
Succus Belladonnæ ..	0.980 to 0.990		18.0 to 22.0	
" Conii ..	0.980 to 0.990		18.0 to 22.0	
" Hyoscyami ..	0.980 to 0.990		18.0 to 22.0	
" Scoparii ..	0.980 to 0.990		18.0 to 22.0	
" Taraxaci	0.995 to 1.000			
Syrupus Aromaticus ..	1.148 to 1.156			
" Aurantii ..	1.270 to 1.280			
" Calcii Lactophosphatis	1.310 to 1.320			
" Cascaræ Aromaticus	1.110 to 1.125			



Name of Preparation.	Range of Specific Gravity.	STANDARD.		Range of percentage (by volume) of Alcohol.	REMARKS.
		(Where there is no active principle mentioned the figure given represents total extractive.)	Grammes per 100 c.c.		
Tinct. Cimicifugæ ..	0.922 to 0.928 ..	2.0		57.0 to 59.0	Physio-toxically standardised, [see page 40.
" Cinchonæ ..	0.915 to 0.925 ..	* 1.0 total alkaloid		63.0 to 64.5	
" Cinchonæ Comp. ..	0.915 to 0.921 ..	5.00		62.0 to 68.0	
" Cinnamomi ..	0.900 to 0.904 ..	* 0.5 total alkaloid		66.0 to 68.0	
" Cocci ..	0.950 to 0.955 ..	2.4		42.0 to 44.0	
" Colchici Seminum ..	0.945 to 0.955 ..	2.5		42.0 to 44.0	
" Conii ..	0.895 to 0.900 ..	0.10 total alkaloid		66.0 to 68.5	
" Croci ..	0.924 to 0.928 ..	0.09 total alkaloid		56.0 to 58.0	
" Cubebæ ..	0.840 to 0.845 ..	3.00		83.0 to 85.0	
" Digitalis ..	0.928 to 0.934 ..	2.0 oleo-resin		53.0 to 57.5	
" Ergotæ Ammon. ..	0.932 to 0.939 ..	3.6		48.0 to 52.0	
" Ferri Perchlor ..	1.085 to 1.088 ..	4.0		18.0 to 21.0	
" Gelsemii ..	0.917 to 0.925 ..	0.025 total alkaloid		57.0 to 59.0	
" Gent. Comp. ..	0.964 to 0.968 ..	5.0		42.5 to 43.5	
" Guaiaci Ammon. ..	0.894 to 0.900 ..	15.0		69.0 to 71.0	
" Hamamelidis ..	0.950 to 0.954 ..	2.0		42.0 to 44.0	
" Hydrastis ..	0.920 to 0.926 ..	2.5		56.0 to 58.0	
" Hyoscyami ..	0.950 to 0.965 ..	0.008 total alkaloid		40.5 to 42.5	
" Iodi ..	0.878 to 0.882 ..	* 2.5 iodine		84.0 to 86.0	
" Jaborandi ..	0.950 to 0.960 ..	0.048 total alkaloid		42.0 to 44.0	
" Jalapæ ..	0.905 to 0.910 ..	* 1.5 resin		65.0 to 67.0	
" Kino ..	0.992 to 0.996 ..	5.0 kino-tannic acid		43.0 to 44.5	
" Krameriæ ..	0.934 to 0.938 ..	5.0		56.0 to 58.0	
" Lavand Comp. ..	0.836 to 0.840 ..	0.6		86.5 to 88.5	
" Limonis ..	0.880 to 0.888 ..	2.0		67.5 to 71.5	
" Lobeliæ Æther..	0.810 to 0.816 ..	0.07 lobeline		58.0 to 60.0	
" Lupuli ..	0.930 to 0.940 ..	4.0		54.0 to 57.0	
" Myrrhæ ..	0.850 to 0.855 ..	5.6		84.0 to 86.0	
" Nucis Vomicae ..	0.910 to 0.914 ..	* 0.25 strychnine		58.0 to 64.0	



Tinct. Opil	..	..	..	0.955 to 0.960	0.75 morphine	40.0 to 44.0	Physio-toxically standardised, [see page 40.]
" Opil Ammon.	..	..	..	0.895 to 0.900	*0.113 morphine	60.0 to 63.0	
" Podophylli	..	..	..	0.850 to 0.855	3.65 resin	84.5 to 89.0	
" Pruni Virg.	..	..	..	0.930 to 0.938	3.0	52.0 to 57.0	
" Pyrethri ..	..	..	..	0.895 to 0.900	2.25 (0.22—0.36)	66.0 to 69.0	
" Quassia ..	..	..	..	0.944 to 0.948	0.05 quassin	42.0 to 44.0	Physio-toxically standardised, [see page 40.]
" Quillaire ..	..	..	..	0.918 to 0.924	1.25	56.0 to 58.0	
" Quinina ..	..	..	..	0.885 to 0.895		72.5 to 76.0	
" " Ammon.	..	..	..	0.925 to 0.928		53.0 to 54.0	
" Rhei Comp.	..	..	..	0.970 to 0.975		51.0 to 53.0	
" Scilla ..	..	..	..	0.955 to 0.962	4.50 (ksolve in glycerine)	52.0 to 54.0	Physio-toxically standardised, [see page 40.]
" Senega ..	..	..	..	0.935 to 0.938	6.5	55.0 to 57.0	
" Senna Comp.	..	..	..	0.985 to 0.994	10.00	38.5 to 40.5	
" Stramonii	..	..	..	0.896 to 0.900	2.00	66.0 to 68.0	
" Strophanthi	..	..	..	0.950 to 0.964	0.04 total alkaloid	42.0 to 44.0	
" Sumbul ..	..	..	..	0.892 to 0.895	0.2 strophanthin	67.0 to 69.0	Physio-toxically standardised, [see page 40.]
" Tolutana..	..	..	..	0.895 to 0.900	2.5	66.0 to 69.0	
	..	..	..	0.860 to 0.865	about 3 balsamic acids	80.0 to 82.0	
	..	..	..		$\frac{1}{3}$ of which are free		
" Valeriana Ammon.	..	..	..	0.935 to 0.942	3.0	50.0 to 54.0	
" Zingiberis	..	..	..	0.835 to 0.840	0.4	88.5 to 89.5	
Vin. Colchici ..	..	..	..	1.010 to 1.015	7.0		
" Ferri ..	..	..	..		0.40 total Fe.		

\* Officially Standardized

# PHYSIO-TOXIC STANDARDISATION.

WE reprint below the standards we have adopted for certain Galenicals which do not lend themselves readily to chemical standardisation, and which are of so important and potent a nature as to render their therapeutical uniformity an absolute necessity (see also Reports No. 14, pp. 33-35, No. 15, pp. 37-38).

## STANDARDS.

**Liquid Extract of Ergot.**—Normal Liquid Extract of Ergot shall be of such a strength that 0·66 c.c. shall cause a rise in blood pressure of 60 mm. in an animal weighing 1,500 grammes.

**Tincture of Digitalis.**—Normal Tincture of Digitalis shall be of such a strength that the minimum lethal dose per 100 gramme of frog is 16·5 minims, such dose proving fatal within 4 hours.

**Tincture of Squills.**—Normal Tincture of Squills shall be of such a strength that the minimum lethal dose per 100 gramme of frog is 20 minims, such dose proving fatal within 4 hours.

**Tincture of Strophanthus.**—Normal Tincture of Strophanthus shall be of such a strength that the minimum lethal dose per 100 gramme of frog is 4 minims, such dose proving fatal within 4 hours.

We should here remark that we do not claim to make preparations to correspond exactly with these standards, our procedure being to prepare a batch exactly according to the directions of the British Pharmacopœia, and to test its activity with reference to these standards. Many separate tests are necessary to secure a correct average result, and to eliminate the possible disturbing effects of peculiarities in individual animals; from the result a factor is obtained giving the comparative strength of the new preparation in relation to the above standards, and this factor is affixed to every bottle sent out.

# SOUTHALL'S MATERIA MEDICA.

By JOHN BARCLAY, B.Sc. (Lond.), F.C.S.

*Sometime Lecturer on Materia Medica and Pharmacy in the  
Mason College, Birmingham, and extra-mural Examiner in  
Materia Medica to the Birmingham University.*

---

WE have to announce that the sixth edition of this work is practically exhausted and that a new edition, revised and brought fully up to date is in the press and will be ready in time for the re-opening of the Pharmaceutical Schools in October next.

# SOUTHALLS' STANDARD POWDERS

For ANALYSTS and PHARMACISTS.

IN view of the present-day wide-spread adulteration of powdered drugs, and in order to supply a recognised need of candidates for the Microscopic Examination in Foods and Drugs of the Institute of Chemistry, we have during the past year introduced the above collection.



The object of the collection is to supply a series of "Standard Powdered Foods and Drugs," which the analyst or pharmacist may have beside him as an absolute criterion of purity when examining doubtful samples, and which should prove of the greatest value to public analysts, students, and all concerned with the microscopical examination of food and drugs.

The need of a collection of such standards is well shown by the numerous enquiries received from all parts, sets having been supplied to analysts and institutions at home and in New Zealand, Australia, the United States, etc.

Full particulars, with lists of contents, free on application.

## PRESS NOTICES

THE ANALYST, *October*, 1905:—"Will be found very useful when a microscopical examination of a doubtful specimen has to be made."

THE CHEMIST AND DRUGGIST, *August 12th*, 1905:—"We are sure that Messrs. Southall have taken pains to supply genuine samples, upon which the utmost reliance can be placed."

THE PHARMACEUTICAL JOURNAL, *August 5th*, 1905:—"Should prove of very great value to candidates for the microscopical examination in foods and drugs in the Institute of Chemistry."

## THE QUALIFIED RETAIL CHEMIST AND ANALYTICAL WORK.

---

WE again wish to draw the special attention of our customers and others to the arrangements we have made whereby they may undertake analytical work required by the public. We are fully convinced that a lucrative business may be done in this class of work if proper facilities for obtaining analyses on reasonable terms were placed within reach of the public. The daily increasing demand for assurance as to the purity of foods and drinks should, in our opinion, be put to profitable use by qualified chemists, and where, as is often the case, it is impossible for them to undertake work of this class themselves, it is obvious to us that the opportunity of having it done speedily, and of at the same time sharing in the proceeds, will be generally acceptable.

*Detailed circulars will be sent free on application.*

## GUARANTEE OF QUALITY.

---

ALL Tinctures, Infusions, Liquid Extracts, and in fact most of the Galenicals we supply are Standardised by our special methods, full particulars of percentage contents being in most instances given on the label.

When we label a drug or preparation P.B. we take full responsibility for its quality, and are prepared to stand by the fact that it is as labelled when it leaves our warehouse, and similarly we guarantee all official preparations to be in accordance with the descriptions on the labels.





